COMMONWEALTH of VIRGINIA

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MEMORANDUM

TO: State Water Control Board Members

FROM: Ellen Gilinsky, Ph.D., Director, Division of Water Quality Programs

SUBJECT: **Request to Proceed to Public Hearing and Comment on Proposed Amendments to the Water Quality Standards – Triennial Review**

EXECUTIVE SUMMARY

Staff intends to ask the Board for approval to go to public hearing and comment on amendments to the Water Quality Standards regulation (*State Water Control Board, 9 VAC 25-260 Virginia Water Quality Standards, Triennial Review Proposed Amendments* attached). The Board has a legal mandate for a review of the Water Quality Standards under the Code of Virginia §62.1-44.15(3a) and federal regulation at 40 CFR 131 at least once every three years. During this review the Board must adopt, modify or cancel standards as appropriate. This rulemaking is needed because new scientific information is available to update the water quality standards and changes are needed to improve permitting, monitoring and assessment programs. The goal is to provide the citizens of the Commonwealth with a technical regulation that is protective of water quality in surface waters, reflects recent scientific information, reflects agency procedures and is reasonable and practical. An ad hoc advisory committee advised staff on the amendments. The most important changes are a narrative criterion to recognize that certain waters in the Commonwealth are naturally low in dissolved oxygen and pH (swamp waters), updates to the toxics and bacteria criteria and special standards to reflect site specific conditions.

BACKGROUND

A Notice of Intended Regulatory Action was published September 18 – November 17, 2006 and a public meeting held in Richmond on October 12, 2006. Comments were received from nine organizations (*Summary of Comment from the Notice of Intended Regulatory Action* attached). An ad hoc advisory committee consisting of 23 members was formed (*Ad Hoc Advisory Committee Members* attached) and held five meetings (December 2006 – May 2007). The meetings were summarized and may be seen online at http://www.deq.virginia.gov/wqs/rule.html#TR .

IMPORTANT ISSUES

The following paragraphs summarize the key sections of the regulation:

Dissolved Oxygen, pH in Class VII, Swamp Waters § 9 VAC 25-260-50
Virginia has some unique aquatic ecosystems in eastern and southeastern Virginia that are naturally low in dissolved oxygen (D.O.) and pH and the aquatic biota have adapted to these conditions. While the regulation includes a separate classification for these waters (Class VII Swamp Waters), many waters have been listed as impaired under section 303(d) of the Clean Water Act for D.O. and pH because they were listed prior to having specific information about the natural conditions of these waters. To address this concern, a narrative exemption from the dissolved oxygen and pH criteria is proposed for these waters when it is determined that conditions are natural and not due to human-induced sources. It was decided that the most protective approach would be to use a narrative criterion to recognize the natural fluctuations of these waters rather than to develop numerical criteria for each swamp. This approach is supported by the Department of Game and Inland Fisheries and the US Fish and Wildlife Service. In addition to the narrative, the proposal includes an adjustment to the existing Class VII pH criterion from 4.3 – 9.0 to 3.7-8.0 to better reflect natural conditions.

The proposal also includes the deletion of section 55 (Implementation procedure for dissolved oxygen criteria in waters naturally low in dissolved oxygen). This section was designed to address natural dissolved oxygen impairments for the stratified waters of the Bay, stratified lakes and swamp waters. The Bay and lakes have been addressed via other rulemakings and since we are now addressing the swamp waters via a narrative criterion, the section is no longer needed.

Table of Parameters (Toxics) § 9 VAC 25-260-140
The Table of Parameters contains toxics water quality criteria for protection of human health and aquatic life. The criteria are expressed in terms of concentrations as parts per billion (micrograms/liter). Triennial Review is the appropriate time to update the Table based on new technical information on the toxicity of these parameters to human health and aquatic life.

> **Human Health 93 Revised Parameters -** The Table of Parameters has been updated and most of the human health parameters have been recalculated using the EPA 2000 Human Health Methodology. The new methodology results in human health criteria that are 60-80% more stringent. This could have an economic impact on permittees if these particular pollutant parameters are present in their effluent.
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> **Human Health Unchanged Arsenic and Nickel -** Exceptions to the new human health methodology are for the parameters arsenic and nickel. Arsenic and nickel are under review at EPA and states are not expected to incorporate the new methodology with these two parameters. Therefore arsenic and nickel remain unchanged.
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> **Human Health Added Methyl Mercury Fish Tissue -** Also included in the Table of Parameters is a new fish tissue criterion for methyl mercury of 0.30 mg/kg. Mercury is methylated quickly in the environment and bioaccumulated in the fatty tissue of fish.

EPA determined the best way to protect designated uses was to develop a fish tissue criterion rather than a water column number. This is agreeable to DEQ since we monitor fish tissue for many bioaccumulative substances; including mercury. This is the first fish tissue criterion for Virginia.

Aquatic Life Added Nonylphenol - Nonylphenol is a new criterion which is an organic chemical produced in large quantity in the United States. It is toxic to aquatic life, causing reproductive effects in aquatic organisms. It is used as a chemical intermediate and is often found in wastewater treatment plant effluent as a breakdown product from surfactants and detergents.

Aquatic Life Added Diazinon - Diazinon is a new criterion and is toxic to aquatic life, particularly invertebrates. Diazinon is frequently found in wastewater treatment plant effluent and urban and agricultural runoff.

Aquatic Life Revised Cadmium - Staff is recommending a revision to the existing aquatic life criteria for cadmium based on more recent EPA guidance. The cadmium proposed criteria is more stringent than the existing criteria.

Aquatic Life Revised Tributyltin - Staff is recommending a revision to the existing aquatic life criteria for tributyltin based on more recent EPA guidance. The tributyltin revised criteria is less stringent than the existing. It is possible the revised tributyltin criteria will result in removal of some or all of the Elizabeth River from the impaired waters list for that compound (it is still listed as impaired for other parameters).

Bacteria for Recreational Waters § 9 VAC 25-260-170

Staff is proposing two alternatives for the geometric mean criteria for bacteria. The purpose of this is to receive public input on the pros and cons of both values. Only one value will be adopted into the final regulation. The first value is 126 colony forming units (CFU)/100 ml of water which is the existing criterion and is based on an illness rate of 0.8% (8 out of 1000 swimmers may get gastrointestinal illness). The second value is 206 and is based on an illness rate of 1.0% (10 out of 1000 swimmers may get gastrointestinal illness). It is the illness rate that will be the focus of public comment. Note that the illness rate risk level for Virginia coastal beaches is, and always has been, 1.9% (19 out of 1000 swimmers – this is not a change from existing regulation). An illness rate of 8 -10 is considered protective of primary contact recreation in freshwater and is acceptable to EPA. A document entitled *Policy Question for Revisions to Bacteria Criteria in VA Water Quality Standards* is attached and explains this issue in more detail.

The Commonwealth and DEQ will benefit from a change to a risk level of 1.0%. To illustrate this benefit, staff had done some preliminary modeling efforts via the Total Maximum Daily Load (TMDL) program and found that the slight adjustment from 126 CFU to 206 CFU provides more reasonable, but still very challenging, bacteria reduction targets in some watersheds. For example, at the current level many watersheds must eliminate 100% of the bacteria loading to the watershed, including natural input from wildlife. This makes many TMDLs impractical to implement and, for stakeholders, undermines the feasibility of achieving standards and the

credibility of the program. It is believed a more reasonable and attainable criterion will increase the willingness to participate in the voluntary aspects of the TMDL implementation plans. DEQ and the Department of Health have discussed this issue and the VDH has decided to remain neutral on the issue, neither supporting nor opposing the increase in the illness rate.

The bacteria section has also been clarified to list the geometric mean as the main criteria to protect primary contact recreational uses as this is considered the environmentally relevant endpoint. Where there is insufficient data to calculate the geometric mean, then no more than 10% of the total samples in the assessment period shall exceed a maximum value (e.g. 235 or 384 for E. coli). This is a change from the existing regulation which lists both the geometric mean and the single sample maximum as the main criteria. Also, the presentation of two values (e.g. 235 or 384) is because these values are mathematically derived from the geometric means, which are presented as two alternatives.

Also included in the regulation are single sample maxima criteria for use in establishing beach advisories and closures in freshwater and saltwater. Two values (e.g. 235 or 384) are presented here as well because these values are mathematically derived from the geometric means, which are presented as two alternatives.

The requirement that no more than 10% of the total samples in the assessment period shall exceed a maximum value when there is not enough data to calculate a geometric mean will generally be used for DEQ monitoring and assessments since those programs will not usually have enough data to calculate a geometric mean. However, the TMDL program will always have sufficient data (through modeling) to calculate geometric means so the TMDL endpoints will be the geometric means.

The secondary contact subsection has been modified to reflect the same structure and wording as the primary contact section and an antidegradation statement has been added as a 'reminder' that if a designated secondary contact water body has better water quality than that specified by the criteria, that quality shall be maintained.

Special Standards § 9 VAC 25-260-310

There are several new special standards proposed and special standard "ff" was significant to the Environmental Protection Agency during the ad hoc discussions because it is associated with a parameter (manganese) that applies to a public water supply. Manganese is referred to as a "taste, odor and aesthetic" criterion, is derived to prevent staining of laundry and applies at the drinking water intake. Unless otherwise specified, all metals criteria are considered to apply to the "total" amount of metal in the water as opposed to a fraction of the total (e.g. dissolved). A permittee in the Roanoke Basin who discharges to a public water supply requested DEQ to work with the Health Department to determine the appropriate manganese criterion for this water supply since background total concentrations were much higher than the criterion. The Health Department recommended a protective criterion to prevent staining of laundry in this water supply would be "dissolved" and this is what staff recommends for special standard "ff."

Another special standard "gg" was significant to the stakeholders during the ad hoc discussions. Special standard "gg" is a new benthic numerical criterion for the Little Calfpasture River which

reflects a subcategory of benthic aquatic life uses due to the presence of Goshen Dam. It is common that aquatic life uses will be modified below dams. However, the standards do not reflect this. This is the first time we are establishing a subcategory of aquatic life use based on the hydrologic modification, which is one of the six reasons EPA allows states to change aquatic life uses. This is also the first time we are incorporating a quantitative measure that reflects the benthic community health. The proposal uses a metric called the Stream Condition Index which recently became a routine component in our macroinvertebrate monitoring program to assess the general criteria and to make decisions about the health of state waters. The standard applies a stream condition index of 20.5 to less than 200 yards of the Little Calfpasture River below the Goshen Dam. Generally, a stream condition index of 60 or greater [out of 100] is considered fully attaining the aquatic life use. Several members of the ad hoc group were concerned about the low metric and where it applied. Staff addressed their concerns by making the segment very small where the low metric applies (immediately below the dam).

Other
There are other amendments proposed and these are listed on the attachment entitled *Summary Table Triennial Review Water Quality Standards Amendments.* These other amendments are generally housekeeping or for clarity and are not expected to generate significant public comment.

ISSUES REQUIRING FURTHER CONSIDERATION

Several other issues were discussed with the advisory committee but staff does not believe revisions to the regulation are warranted at this time:

Antidegradation § 9 VAC 25-260-30
Several members of the ad hoc advisory group want DEQ to change agency procedures for implementation of the antidegradation policy. The premise of the antidegradation policy is to maintain water quality when the background concentrations are better than the criteria concentrations. Waters at or worse than the criteria are identified as 'Tier 1.' Waters with quality better than the criteria are identified as 'Tier 2' waters. DEQ guidance currently allows all the permit limits to be based on the criteria concentration (Tier 1) when one criteria concentration is exceeded in the stream. There are exceptions to that rule that add conservatism to our policy. For example, bacteria, dissolved oxygen, fish tissue or nutrient concentrations cannot be used to place a water in Tier 1. Also, public water supplies, trout streams and streams with no data are automatically Tier 2. However, the environmental groups would like us to be very specific and consider antidegradation tiering decisions to be made for each parameter. The change to the permitting practices do not require a change in the standard, rather a change in procedure. This will be discussed as guidance for the triennial review moves forward.

Mixing Zones for Persistent Bioaccumlative Toxicants § 9 VAC 25-260-20
Several members of the ad hoc advisory group want DEQ to restrict mixing zones for persistent bioaccumlative toxicants (PBTs). Some options presented were to restrict mixing for these PBTs for all dischargers, to new dischargers only, or just in endangered and threatened species waters. One of the most notorious PBTs are polychlorinated biphenyls (PCB). DEQ is only recently developing guidance for monitoring PCBs in wastewater discharges using low level analytical

procedures. DEQ is also working on developing the Potomac PCB total maximum daily loads (TMDL), the Bluestone River PCB TMDL, with several others planned. Delaware has been addressing PCBs via pollution minimization plans at various sites which seem to be successful (as opposed to permit limits). Because of a new lower analytical detection limit we are finding PCBs in municipal effluent at levels higher than the criteria. DEQ is evaluating these data to determine the share of point source discharges to the overall PCB load.

Many PBTs may be found in municipal or industrial effluents; however, these are generally not considered the major sources, but rather these pollutants enter the water via more diffuse sources, such as legacy spills or mercury deposition. Because of the unknowns associated with such a requirement, staff decided not to recommend an amendment, but will revisit the issue in a future triennial review.

Ammonia, Copper, Cadmium and Cyanide Criteria § 9 VAC 25-260-140
During the ad hoc meetings, DEQ was presented new scientific information that suggested the existing ammonia and copper criteria were not protective of endangered mussels and should be updated (made more stringent) using this new information. New information was also shared with DEQ during the ad hoc on updated cadmium and cyanide data that suggested the existing criteria were too stringent and should be relaxed. DEQ staff carefully reviewed all the studies and determined that these criteria may need to be updated. However, due to the fact that EPA is reviewing some of these issues on a national level (ammonia and copper), the issues are very complex and the impact may be very great, particularly to municipalities, we recommend not incorporating this new data in the criteria calculations for ammonia, copper, cadmium and cyanide criteria at this time. All the technical issues would be best worked out in a separate advisory committee and incorporated as a separate rulemaking at a later date after additional guidance is received from EPA.

Endangered Species
Several members believe the state and federal endangered and threatened species waters should be listed in the water quality standards. Mixing zone prohibitions, more protective ammonia and copper criteria and the halogen ban would then apply to those waters. As described above, staff decided not to make additional mixing zone prohibitions or change the ammonia and copper criteria at this time. If we do decide to make those changes, staff is not convinced that these species and locations need to be listed in the regulation. This information exists elsewhere and could be referenced. Additionally, a memorandum of agreement has been signed which describes procedures for coordination among the DEQ, the Department of Game and Inland Fisheries, the Department of Conservation and Recreation, Division of Natural Heritage and the U.S. Fish and Wildlife Service in obtaining input regarding threatened and endangered species and habitat during the Virginia Pollutant Discharge Elimination System permit issuance process.

ATTORNEY GENERAL CERTIFICATION

These amendments have been forwarded to the Office of the Attorney General for agency statutory authority, but authority has not yet been granted. The amendments will be proposed "contingent upon Attorney General Office statutory authority" if not received by the June Board meeting.

ATTACHMENTS

Attachments to this memo to aid in your review of these regulatory amendments are as follows:

State Water Control Board, 9 VAC 25-260 Virginia Water Quality Standards, Triennial Review Proposed Amendments, May 2007

Summary of Comment from the Notice of Intended Regulatory Action, November 2006

Ad Hoc Advisory Committee Members, May 2007.

Policy Question for Revisions to Bacteria Criteria in VA Water Quality Standards, April 2007

Summary Table Triennial Review Water Quality Standards Amendments, June 2007